INDIANA DEPARTMENT OF NATURAL RESOURCES

REPORT FOR ENVIRONMENTAL REVIEW OF ARTIFICIAL WETLANDS DESIGNED TO ENHANCE WATER QUALITY OF HAMILTON LAKE, INDIANA

HARZA ENGINEERING COMPANY

November 1991

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Hamilton Lake Enhancement Project
IDNR Environmental Review of Projects
Early Coordination Process

Wetland A

Existing Site Conditions

This project involves the construction of a small earthen dam and spillway on Haughey Ditch to create a wetland (See Exhibit 1 for location). The project's purpose is protection of Hamilton Lake water quality.

Existing land use at Site A is agricultural rowcrops. Shrubs line the stream banks in places, but this vegetation is limited to the stream banks themselves, as the overbank areas are regularly tilled. Farm land surrounds the site. Site A's normal pond area will be 12 acres. The extended detention pond will be 21 acres.

No utility or transportation rights-of-way are required. Landowner agreements for construction and operation of the wetland are nearing completion.

Although surveys have not been performed, wildlife ranging across the site would be typical of rural Indiana, ranging from white-tailed deer to small rodents, herpetiles, and birds. No threatened or endangered species will be impacted.

Description of the Proposed Project

Project features will include the earthen dam, a grass-lined spillway, and excavation (See Exhibit 2). The dam will be constructed from material excavated near the channel and the spillway. The fill material will be a silty clay. Dam height will be 9.9 ft with upstream and downstream slopes of 3H:1V and a 10-ft-wide crest. The dam will be 60 ft across at the widest part. A rectangular notch will be used for dewatering prior to maintenance and sediment removal. Stoplogs will be placed in the notch for retention.

The uncontrolled overflow spillway will be a grass lined channel. The crest will be 150 ft wide; side slopes will be 3H:1V. Aside from excavation for building the spillway, excavation will be limited to the mouth of the permanent pool, designed for a bed load trap. Stripping and grubbing will be required for construction of the dam and spillway.

The primary environmental consequence of the project is to reduce sediment and associated agricultural chemical transport to Hamilton Lake.

Secondary Development

Access to the site be via the existing field road along the downstream channel (See Exhibit 1).

No sewer lines or utilities will be needed.

Backwater effects have been taken into consideration during the design and property damage is not expected during flooding.

Wetland B

Existing Site Conditions

In order to increase the sediment trapping efficiency of existing wetlands located along Lillian Metz Ditch, a portion of flow will be diverted away from the existing channel through wetlands lying to the east and west of the channel. Diverted flowage will receive some treatment by passing through the existing wetlands before the flow returns to the existing channel (See Exhibit 1 for location).

Existing land covers at Site B are agricultural rowcrops and grasslands, the latter being part of the Conservation Reserve "Set-aside" Program (CRP). The stream is regularly maintained by the Drainage Board and the stream banks are grassed rather than wooded.

No utility or transportation rights-of-way are required. Landowner agreements for construction and operation of the wetland are nearing completion.

Although surveys have not been performed, wildlife ranging across the site would be typical of rural Indiana. No threatened or endangered species will be impacted.

Description of the Proposed Project

The ditches will be constructed by excavating a 20-ft-wide base with 4H:1V side slopes (See Exhibit 3). The excavated material will be placed along the existing channel. Total channel length will be 900 ft with less than 1% slope. Total excavation on site is approximately 2,000 cy.

The primary environmental consequence of the project will be reduced sediment and associated agricultural chemical transport to Hamilton Lake.

Secondary Development

The existing field road will be used as the access road (See Exhibit 1).

Vegetation in the wetland will not be adversely affected by flood water runoff. Backwater effects are negligible.

Wetland E

Existing Site Conditions

This project involves the construction of a small gabion and sheet pile dam on Black Creek to create a wetland (See Exhibit 1 for location). The project's purpose is protection of Hamilton Lake water quality.

Existing land cover at Site E is water and riparian canopy. The stream banks are quite steep and vegetated with floodplain species. The largest tree noted during reconnaissance was a 30 inch dbh (diameter at breast height) sycamore. The overbanks are used for rowcrops and will not be affected by the impoundment.

No utility or transportation rights-of-way are required. Landowner agreements for construction and operation of the wetland are nearing completion.

Although surveys have not been performed, wildlife ranging across the site would be typical of rural Indiana. No threatened or endangered species will be impacted.

Description of the Proposed Project

The gabion/sheet pile structure acts as both a dam and spillway. Total structure length is 160 ft, with a maximum height of 5 ft above existing flood plain and 9.9 ft above the stream bed (See Exhibit 4).

The sheet pile section is located in the existing channel and is 40 ft long. A 12-inch low-level outlet notch will exist in the sheet pile for dewatering prior to maintenance and sediment removal. The top of the sheet pile is 5 ft above the bottom of existing channel.

The gabion section will be constructed with 3ft x 3ft gabions on the shallow banks. Cobbles from the Black Creek stream bed will be used to construct the gabion. An impermeable membrane will be placed on the upstream side and along the bottom of gabions and gabion mats. Fill material will be used to hold the membranes in place. The upstream slope will be 3H:1V and composed of material excavated from the keyway for the gabion section.

Excavation will be minimal and only needed for the 3 ft x 3 ft x 130 ft keyway section. Stripping and some grubbing will be needed for the construction access near the dam site and for construction of the structure.

The primary environmental consequence of the project will be reduced sediment and associated agricultural chemical transport to Hamilton Lake.

Secondary Development

Access to the site will be the Hwy 1 turnoff to the east near Cold Springs Inn. Access will also be possible along field roads and down a proposed 500-ft-long road constructed along the existing channel near the left abutment downstream of the dam (See Exhibit 1).

Backwater effects have been considered in the design and property damage is not expected during flood discharges up to and surpassing the design flood.

Wetland F

Existing Site Conditions

This project involves the construction of a small earthen dam and grassed spillway on an unnamed tributary to create a wetland (See Exhibit 1 for location). The project's purpose is protection of Hamilton Lake water quality.

Existing land cover at Site F is second growth deciduous forest. Adjacent to the site is a home, recently burned to the ground. No utility or transportation rights-of-way are required. Landowner agreements for construction and operation of the wetland are nearing completion. Although surveys have not been performed, wildlife ranging across the site would be typical of rural northern Indiana. No threatened or endangered species will be impacted.

Description of the Proposed Project

The project features will include the earthen dam, a grass-lined spillway, and excavation near the base of the dam (See Exhibit 5).

The dam will be constructed using excavated silty clay from the spillway area. Dam height will be 9.9 ft above the bottom of the existing channel (See Exhibit 6). The upstream and downstream slopes will be 3H:1V with a 10-ft-wide crest. The dam will be 70 ft at the widest section. An 18-inch-diameter concrete pipe will be placed through the base of the embankment for dewatering prior to maintenance and sediment removal. A rectangular concrete riser will be the inlet to the culvert.

The uncontrolled overflow spillway will be a grass-lined channel constructed by excavating and reseeding the area. The crest at the base of the grass-lined channel will be 75 ft wide with side slopes of 3H:1V. A total of 3,700 cy of material will be excavated from the spillway. Stripping and grubbing will be done near the dam site for construction access and for construction of the dam and spillway.

The primary environmental consequence of the project will be reduced sediment and associated agricultural chemical transport to Hamilton Lake.

Secondary Development

The access road will be the existing field road along the existing channel to the East (See Exhibit 1).

No sewer lines or utilities will be needed.

Backwater effects have been taken into consideration during the design and no property damage is expected during flooding.

Wetland G

Existing Site Conditions

This project involves the construction of a small earthen dam and culvert outlet on an unnamed tributary to create a wetland (See Exhibit 1 for location). The project's purpose is protection of Hamilton Lake water quality.

Existing land cover at Site G is palustrine emergent wetland. The site is adjacent to a gravel quarry, the runoff of which is deposited in the wetland after storms.

No utility or transportation rights-of-way are required. Landowner agreements for construction and operation of the wetland are nearing completion.

Although surveys have not been performed, wildlife ranging across the site would be typical of rural Indiana, ranging from white-tailed deer to small rodents, herpetiles, and birds. No threatened or endangered species will be impacted.

Description of the Proposed Project

The project will include the earthen dam and a boxed culvert system as spillway control (See Exhibit 7). The earthen dam will be constructed from material excavated from the left abutment for construction of the box culvert. The material will be silty sand. The dam will be 9.9 ft in height (See Exhibit 8). The upstream and downstream slopes will be 3H:1V with a 10-ft-wide crest. The final width will be 80 ft at the widest section. A 10-ft-deep keyway will be constructed by excavation, consolidation, or displacement of foundation soil to provide stability for the embankment.

The controlled overflow spillway will be a 4-barrel boxed culvert system capable of handling the 100 yr event. Each culvert is 5 ft x 7 ft and 45 ft in length. A 30 ft x 35 ft riser 6 ft high provides the entrance into the culvert system. The low-level outlet will be a stoplogged notch in the box culvert riser.

Stripping and grubbing will be required beneath the dam, box culvert, and downstream energy dissipation slab for construction access.

The primary environmental consequence of the project will be reduced sediment and associated agricultural chemical transport to Hamilton Lake.

Secondary Development

Access to the construction site will be through the Flegal Sand and Gravel Quarry (See Exhibit 1).

No sewer lines or utilities will be needed.

Backwater effects have been taken into consideration during the design and property damage is not expected during flooding.

Wetland H

Existing Site Conditions

This project involves the construction of a small earthen dam and culvert outlet to create a wetland (See Exhibit 1 for location). The project's purpose is protection of Hamilton Lake water quality.

Existing land cover at Site H is emergent palustrine wetland and mesic wetlands. The site is adjacent to residential property and forested land. No utility or transportation rights-of-way are required. Landowner agreements for construction and operation of the wetland are nearing completion.

Although surveys have not been performed, wildlife ranging across the site would be typical of rural Indiana. During a site reconnaissance, a white-tailed deer was seen at Site H. No threatened or endangered species will be impacted.

Description of the Proposed Project

The project will include the earthen dam, a grass-lined spillway, and a riser/culvert system (See Exhibit 9). The dam will be constructed using clayey silt excavated during spillway construction. The upstream and downstream slopes will be 3H:1V with a 10-ft-wide crest. The final width of the embankment dam is 50 ft. A 14-inch-diameter concrete pipe will be placed through the base of the dam for dewatering prior to maintenance and sediment removal. The pipe will be inserted inside the existing CMP pipe. An 18-inch-diameter riser will be the inlet for the culvert system.

The uncontrolled overflow spillway will be a grass-lined channel constructed by excavation and reseeding of the area. The crest at the base of the grass-lined channel will be 75 ft wide with side slopes of 3H:1V.

Excavation will be required in the spillway and a small section at the base of the dam for a bed load trap. Approximately 4,000 cy of material will be excavated and used for fill on the embankment. Stripping and grubbing is needed near the dam site for construction access.

The primary environmental consequences of the project include reduced sediment and associated agricultural chemical transport to Hamilton Lake.

Secondary Development

The existing field road will be used as the access road (See Exhibit 1).

No utilities or sewer lines needed.

Backwater effects have been taken into consideration during the design and property damage is not expected during flooding.

PHOTOGRAPHS

1 - Site A, facing west.

2 - Site A. Haughey Creek is shallow with low, well forested banks.

3 - Site A during drilling of borehole AB-2 at location of proposed right abutment.

4 - Site A facing west. Left abutment of dam will be located in center of photograph; spillway will be located to right of photograph.

5 - This low lying area located south of ditch will be incorporated into Wetland A.

6 - Site B, facing west. Ditch flowage will be diverted through the low lying area to enhance the existing sediment trapping characteristics of the site and to enlarge the existing wetland at the left of the photograph. Lillian Metz Ditch is located along the trees at the right of the photograph.

7 - Site B, facing west, Lillian Metz Ditch downstream of the proposed wetland site.

8 - Site B, facing west (upstream) at the downstream limit of the proposed wetland site.

9 - Black Creek at Site E.

10 - Site E, facing north, drilling borehole EB-1 located on the proposed left abutment.

11 - Site E, facing west (downstream) at the location of the proposed sheet pile weir. The hillsides on either side of Black Creek are steeply sloped and well forested. The water was cloudy but flowing slowly.

12 - Black Creek at the location of Site E, facing east (upstream).

13 - Backhoe excavating test pit FT-1, Site F, at the location of the proposed left abutment.

14 - Test pit FT-1, Site F.

15 - Test pit FT-2, Site F.

16 - Drilling borehole GB-1 located on the proposed left abutment for Wetland G.

17 - Drilling borehole GB-2 located at the upstream toe of the proposed earthfill dam.

18 - The upper soil layer at Site G is very soft black silty organic soil.

19 - Creek at Site G.

20 - Site H, facing north (upstream) from the location of the proposed dam.

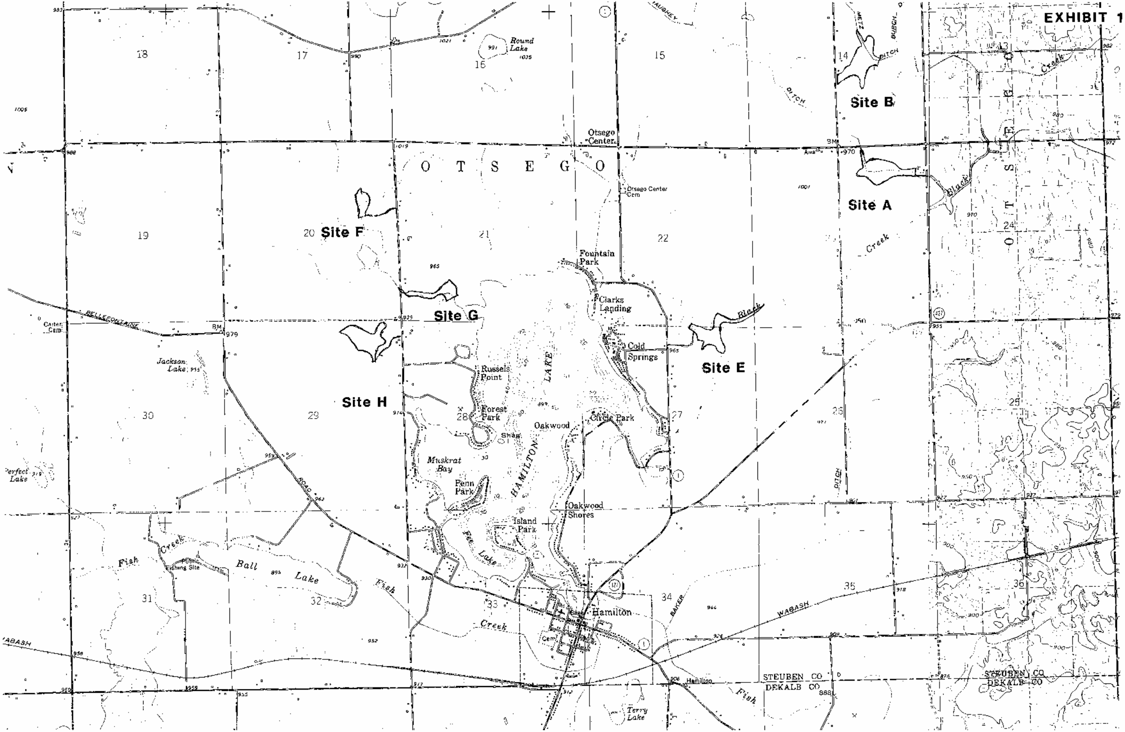
21 - Existing drain pipe which conveys water under berm at Site H.

22 - Site H, facing downstream.

23 - Site H, facing southwest at the upstream limit of the proposed wetland site. The creek is located beyond the left limit of the photograph.

EXHIBITS

EXHIBIT 1



Site A
Site B
Site E
Site F
Site G
Site H
O T S E G O
Otsego Center
Otsego Center Cem
Round Lake
Fountain Park
Clarks Landing
Cold Springs
Russels Point
Forest Park
Oakwood
Circle Park
Muskrat Bay
Fenn Park
HAMILTON LAKE
Oakwood Shores
Island Park
Fee Lake
Hamilton
Jackson Lake
Perfect Lake
Ball Lake
Fish Creek
Public Fishing Site
BELLEFONTAINE ROAD
WABASH
Black Creek
STEUBEN CO
DEKALB CO
Terry Lake

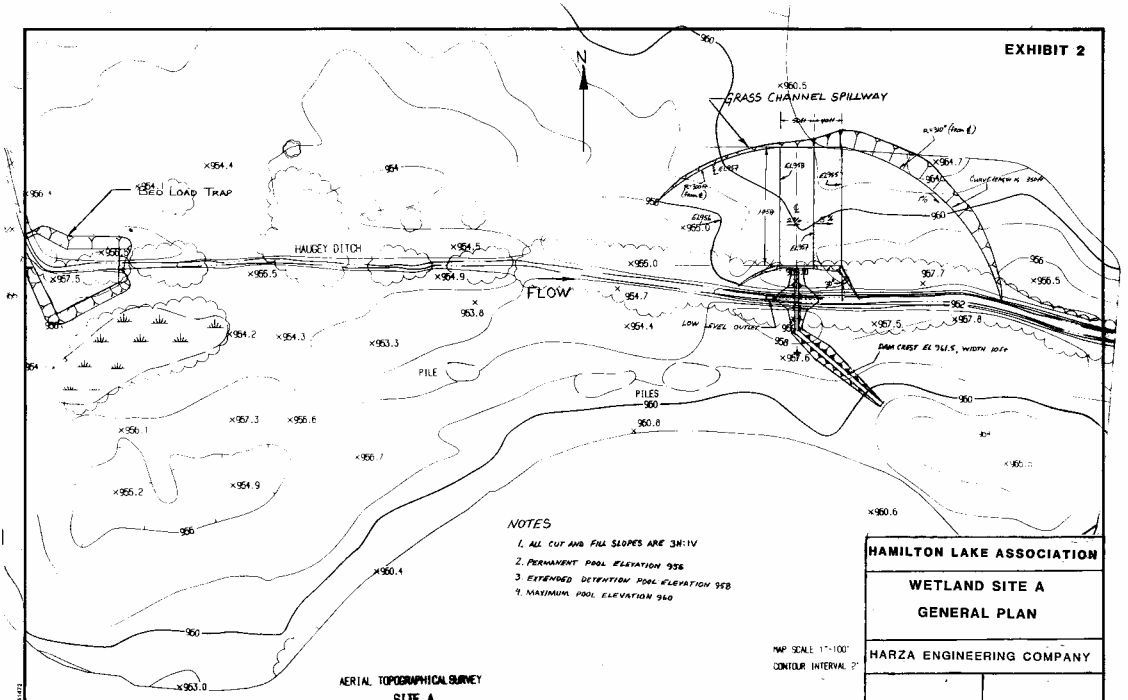


EXHIBIT 2
N
GRASS CHANNEL SPILLWAY
BED LOAD TRAP
HAUGEY DITCH
FLOW
LOW LEVEL OUTLET
DAM CREST EL 961.5, WIDTH 10ft
PILE
PILES
NOTES
1. ALL CUT AND FILL SLOPES ARE 3H:1V
2. PERMANENT POOL ELEVATION 955
3. EXTENDED DETENTION POOL ELEVATION 958
4. MAXIMUM POOL ELEVATION 960
HAMILTON LAKE ASSOCIATION
WETLAND SITE A
GENERAL PLAN
HARZA ENGINEERING COMPANY
MAP SCALE 1"=100'
CONTOUR INTERVAL 2'
AERIAL TOPOGRAPHICAL SURVEY
SITE A

EXHIBIT 3

NOTES:
1. ALL CUT AND FILL SLOPES ARE 4H:1V

SCALE 1 IN = 100 FT

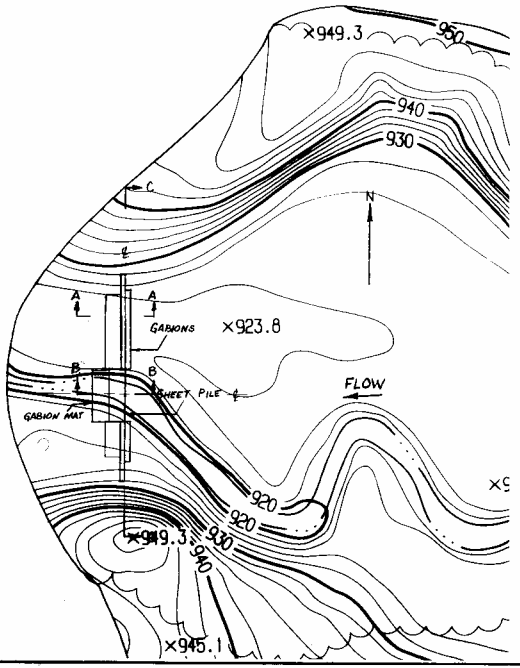
HAMILTON LAKE ASSOCIATION

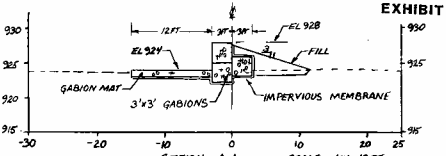
WETLAND SITE B

GENERAL PLAN

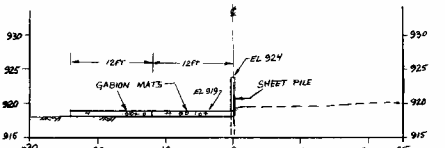
HARZA ENGINEERING COMPANY

EXHIBIT 4

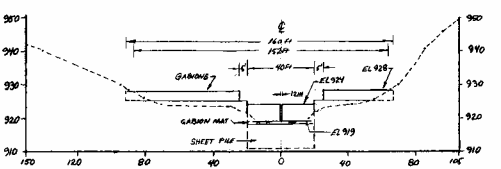




SECTION A-A SCALE 1IN=10FT



SECTION B-B SCALE 1IN=10FT



HORIZONTAL SCALE 1IN=40FT SECTION C-C
VERTICAL SCALE 1IN= 20FT

SCALE 1IN= 50FT

HAMILTON LAKE ASSOCIATION

WETLAND SITE E
PLAN AND SECTIONS

HARZA ENGINEERING COMPANY

A41173

EXHIBIT 5

NOTES:

1. ALL CUT AND FILL SLOPES ARE 3H:1V
2. PERMANENT POOL EL 931 FT
3. EXTENDED DETENTION POOL EL 937
4. MAXIMUM POOL EL 938.5 FT

SCALE 1 IN = 50 FT

HAMILTON LAKE ASSOCIATION

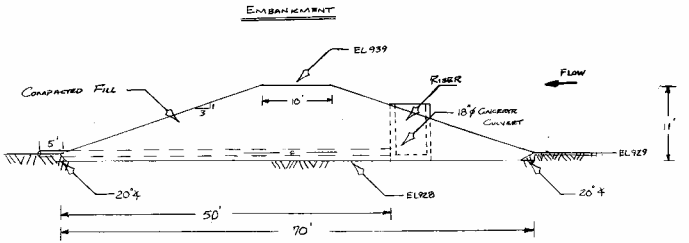
WETLAND SITE F

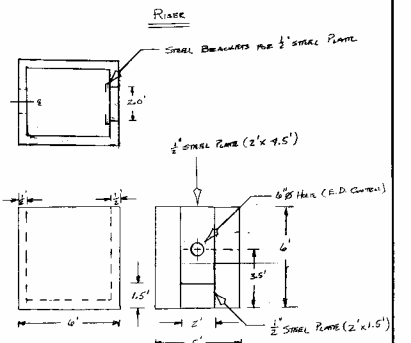
GENERAL PLAN

HARZA ENGINEERING COMPANY

EXHIBIT 6

WETLAND SITE F
SECTION AND DETAILS





HAMILTON LAKE ASSOCIATION

WETLAND SITE F
CROSS-SECTIONS

84472

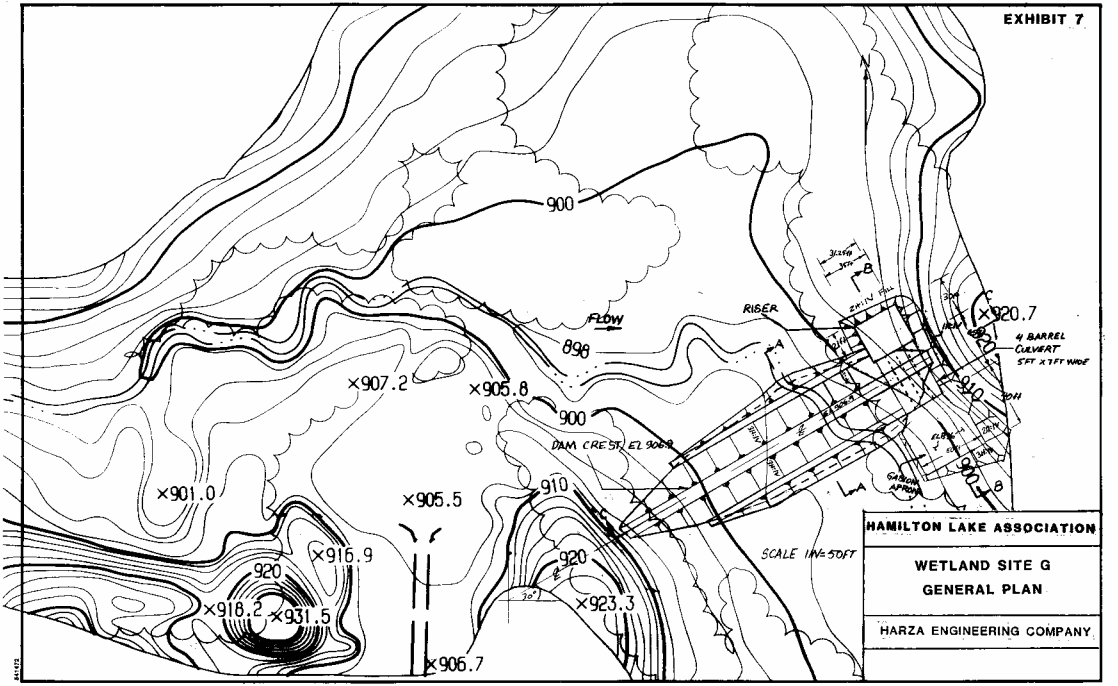
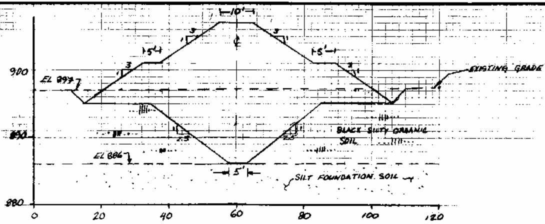


EXHIBIT 7
900
FLOW
898
RISER
×907.2
×905.8
900
DAM CREST EL 906.8
×901.0
×905.5
910
×916.9
920
×918.2
×931.5
×906.7
920
×923.3
×920.7
4 BARREL
CULVERT
5FT x 7FT WIDE
940
940
SCALE 1IN=50FT
HAMILTON LAKE ASSOCIATION
WETLAND SITE G
GENERAL PLAN
HARZA ENGINEERING COMPANY

EXHIBIT 8

WETLAND SITE G

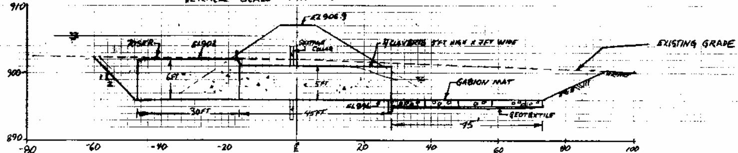
CROSS-SECTIONS



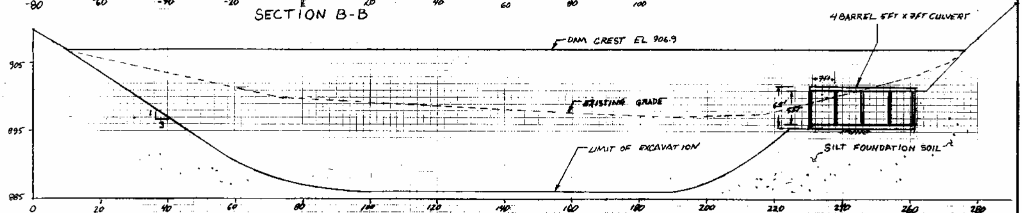
SECTION A-A

HORIZONTAL SCALE 1 IN = 20 FT

VERTICAL SCALE 1 IN = 10 FT

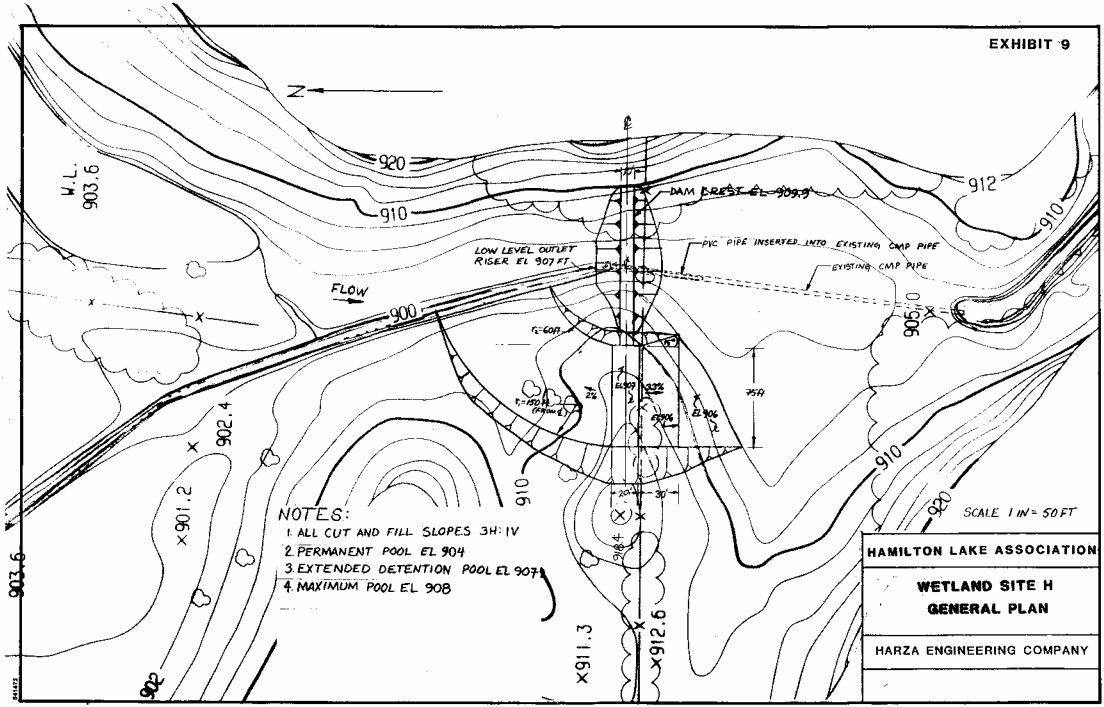


SECTION B-B



SECTION C-C

EXHIBIT 9



HAMILTON LAKE ASSOCIATION

WETLAND SITE H
GENERAL PLAN

HARZA ENGINEERING COMPANY